

Handbook for Assessing Reports About COVID Origins

- a reaction to current reporting as well as to

COVID-related issues as observed in the media and public

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Currently, as of the beginning of March, 2023, reporting about the preliminary views on behalf of several U.S. agencies regarding investigations into the origins of the COVID-19 pandemic feature prominently in major news outlets, with the majority of these news outlets focusing on the views of two of those agencies.

It is the opinion of this author that there's a problem in the way this is being reported, as well as a potential problem with the views as expressed by the two respective agencies as are concerned.

Within a climate of gullibility, misinformation and persistent lack of independently procured information on behalf of a percentage of the population, choices in reporting can have substantial consequences that may not be considered by a number of outlets and their audiences alike. This effort attempts to offer a basic guideline to assessing the information that can be obtained in the current reporting as relating to the subject at hand.

It is not the objective of this text to decide either way on the issue of origins. Since it is meant for a greater variety of readership COVID- and disease-related context had to be given. This text features personal views, it is not neutral.

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1. *Headlines and Contents*

It must first be noted that the headline for an article is often not written by the respective author of the article, and can in some cases only offer insufficient first information about the article's

contents. In a few cases what is suggested in a headline may even outright contradict the gist of what is being expressed in the article.

This is a problem news outlets should be dealing with urgently. Not every reader will be able or willing to read every single article in a day's edition, not even every article the reader might be interested in, but will instead opt for a selection and using the headlines of other items to stay relatively updated. A poorly chosen headline can distort a picture that would otherwise be clearer upon reading the related article.

That said, the majority of articles tackling the current conversation about the attempts to determine the origins of the COVID-19 pandemic in the Wuhan province of China as being undertaken by a number of U.S. agencies reflect their headlines' focus on two of these agencies expressing one tendency of opinion, while making conflicting opinions context.

A notable exception is a recent article by Julian Borger for The Guardian titled 'Competing US views on origins of Covid reveal deeper splits over China policy' that also delves into the geo-political implications of the subject.¹ It must be added that other articles published in The Guardian have followed the same pattern of favouring focus on those two agencies leaning towards a leak of the novel coronavirus strain from a Wuhan-based laboratory where it would have been studied.

The two agencies that have come forward with this preliminary view are the U.S. Energy Department, offering a 'low confidence' finding, followed by the Federal Bureau of Investigation in support of it, attaching a 'moderate confidence'-label.²

This must be viewed in contrast to four other intelligence agencies that view a zoonotic spill-over as the more likely origin of the pandemic, with two more agencies remaining undecided.

A couple of things should already stand out, but might not immediately to every consumer of news:

- a clear majority of agencies favour zoonosis for a cause of the pandemic, yet the focus in the reporting by a large number of news outlets lies with the minority views
- a 'likelihood' is expressed by the agencies holding the minority view, and is reported by the news outlets, while those views have been publicized with 'low confidence', on behalf of the U.S. Energy Department, and 'medium confidence', on behalf of the FBI, respectively.

The majority of involved intelligence agencies expressing a view that differs from the one held by the much more featured minority of agencies begs the question:

Why does the focus of the reporting in so many cases lies with the minority view instead of featuring the majority view at least as prominently, if not more so, and this significantly already in the headlines?

Why is the headline not reading, say, 'Intelligence Agencies Still Split on COVID Origins, with 4 Citing Zoonosis As More Likely, 2 A Lab Leak, and 2 Undecided'?

Or, if more brevity is needed: 'COVID Origins – Zoonosis: 4, Lab Leak: 2, Undecided: 2'?

The question is not meant to be rhetorical, and there are probable answers. The FBI, for example, has a certain prestige to it, more on that under 2. But there are also weighing political aspects to the issue, as well as expectations.

The political context is serious. There are a number of friction areas that result in tensions between China and what we shall for simplicity's sake call the West, even though they involve a number of

1 <https://www.theguardian.com/us-news/2023/mar/01/covid-lab-leak-china-us-relations-biden-administration>

2 For example to be read here:
<https://www.theguardian.com/world/2023/feb/26/covid-virus-likely-laboratory-leak-us-energy-department>
This article is also an example for the focus on the views of the 2 agencies while mentioning the context of conflicting views as 'others'.

East Asian nations siding with the West. Tensions over Taiwan. Tensions over China's relation with Russia during Russia's invasion of a neighbour nation, Ukraine, and the resulting war, with more tensions lingering over a potential military support for Russia on behalf of China. Tensions over spy balloons. Increasing economic tensions.

Any comment that might further raise the heat between China and the West, foremost the U.S., should follow deep consideration. It should be made, if it's made, with high confidence where possible.

'Low confidence' isn't that. 'Low confidence' should not result in an expression of 'likelihood'.

'Medium confidence' shouldn't either.

If this author had a chance to address each of the agencies involved in investigating the origins of the pandemic he would ask them: 'until you've reached a high confidence in your assessment, why not shutting up about it?'

An honest answer would probably involve 'pressure'. Pressure especially as applied by one end of the political spectrum in the U.S., the Republican party, and certain hardliners within this party in particular. This must be seen within a frame of the Republican party as it is today, and the more so this fraction within it, as being a lot more likely to push for quick answers within a light of an already adversary position when it comes to China that is more eager to antagonize in addition to the already existing tensions.

In this context FBI Director Wray may act in good faith and might be thoroughly capable to remain non-partial, and the reminder that he is a Trump-apointee and that the most prominent of his recent interviews on the subject, possibly the most extensive one, had been given to Fox News, an organisation that is currently in the headlines itself due to credible accusations of bias and the propagation of known lies, must be given with caution.³

The context of the average information level on behalf of the public is serious, too.

It is striking how few among the general public appear to have spent their time during lockdown with obtaining good, valid information about what necessitated the lockdown, namely the virus causing the pandemic, and basic information about how viruses work in general. This in mind, as well as an environment of a flurry of conspiracy theories, weak information and outright misinformation, it must be understood that the focus on one specific view on the origins of the pandemic will easily act as a trigger. Reasons that may exacerbate this will be discussed under 5. and 6.

For a responsible news outlet the context of a majority view contrasting the reported on minority view should result in an at least even amount of coverage, if not dominating over the minority view, and this context must already appear in the headline or the visible summary below it.

It must also be understood by the responsible outlet that extensive information about the involved agencies, the reasoning for their involvement as well as for their respective views should be provided, at least by means of links.

2. Agencies

It actually requires some digging when first tuning into the topic as to what agencies and how many are involved in the attempt to find answers about the exact origins of the COVID-19 pandemic, as

³ Excerpt from the Fox interview with FBI Director Wray can be found here, for example:
https://www.youtube.com/watch?v=LL7EnvYxcaI&ab_channel=CNN

well as their respective methods. Within the context of this text we should have a quick look at the two agencies as prominently cited in the bulk of reporting and compare them with the National Intelligence Council, as I see additional problems where the views of these two agencies are met with what might be too readily given credits.

As for the rest, by all means do your own digging. A first overview on all the involved agencies can be obtained on the related Wikipedia page; please note that Wikipedia is not above making mistakes or the need to be further updated.⁴

The FBI

The Federal Bureau of Investigation is the United States' main federal law enforcement tool.⁵ In the most common terms the FBI gets involved whenever a crime is being committed or suspected that meets the definition of a felony that exceeds state jurisdiction, thus falling into national jurisdiction, or that crosses the borders between states. This includes counterterrorism and counterintelligence, qualifying the FBI as a security- and intelligence service. While the FBI does maintain offices in other nations, the principal purpose for this presence consists of liaison with foreign security services. In cooperation with these services the FBI can conduct operations in foreign countries. The FBI priorities lie with crime. Both the ability to act outside its regular national jurisdiction and a staff that includes highly trained forensic specialists across fields does mean it can play a significant role in intelligence gathering when it's about incidents occurring in foreign nations. It can also be assumed that the FBI will seek counsel from specialists outside the Bureau when the subject matter exceeds what it normally deals with.

It is important to remember what we're dealing with. The location of the initial outbreak is a province in a highly protective nation that is generally secretive when it's about its national interests, and that is for a while now in conflict with Western nations, and foremost the United States, over a variety of issues. We're also dealing with a disease. Both the FBI and the Department of Energy maintain that there's no indication at all that this particular virus had been engineered for the purpose of biological warfare. Thus even in the scenario of a lab leak this is about a naturally occurring pathogen that will behave as pathogens do, and it requires a lot more information than is provided by both the respective agencies and the reporting on their findings to make a convincing case for the FBI being an organ of authority on the behaviour of viral pathogens. The FBI's preliminary conclusion can therefore only derive from two focus points in their investigation: analysis of occurrences at and around specific laboratories in Wuhan at a time of interest and expert analysis of the virus itself, which would involve such analysis as having been sought outside the Bureau. The idea of an FBI section that specialises in infectious diseases to the level major world health organisations do stretches credulity even with the possibility of ill intent, i.e. the manufacturing of bio-weapons by adversaries in mind.

The information required for the former should be difficult to obtain from and from within a nation as China, especially in the current political climate. With all its abilities in intelligence gathering, the FBI is not quite the CIA. Reports of researchers from a Wuhan lab being among the first to become ill are not conclusive and are not at this point satisfyingly corroborated; even if true, in an outbreak viral researchers are no better protected than others the moment they leave their labs and safety protocols.

As for analysis made by specialists outside the Bureau, there are some opinions stating that their analysis has shown that the original virus variant had indeed been tampered with in a manner to be expected when subjected to research necessary to understand and protect against it (which is the purpose of these labs), and which would have required to make it more virulent. I'm neither a

⁴ https://en.wikipedia.org/wiki/Investigations_into_the_origin_of_COVID-19

⁵ <https://www.fbi.gov/>

virologist nor an immunologist. But with a majority of assessments so far contradicting the leaning towards a lab leak, including that made by the WHO, it would appear that evidence for such a conclusion remains far from being conclusive – conclusive evidence for the coronavirus strain as having been hampered with before it came into contact with humans and other animals would not have escaped the teams deployed by the WHO and other health organisations.⁶

Bottomline, it is hard to see how the FBI can be among the most qualified agencies and institutions to make such an assessment with confidence (hence, probably, ‘moderate confidence’). They are certainly valuable in the overall effort that’s being conducted by a handsome number of agencies and individuals. But there is no reason to value their conclusions among the top ranking ones. FBI Director Christopher Wray outlined why the FBI not only did but should get involved, as a viral outbreak is a threat to national security, and as with any pathogen there’s always the *possibility* of intent, which has to be assessed and either eliminated or confirmed. He also stated that, as to be assumed, the FBI has collaborated with a variety of specialists within and outside the Bureau. He began with stating that the FBI had ‘for a while now’ assessed that the outbreak could have resulted from a potential lab leak. The already dampening ‘low -’ or in the FBI’s case ‘moderate confidence’ categorisation was illustrated by the Director choosing numerous grammatical conditionals. But the delivery was one of confidence.⁷

We should guard ourselves against the notion of the FBI as ‘super-cops’, a tendency in part created by representation in fiction, but one that wields power even over some of those with a more hostile mentality towards the FBI as driven mainly by ideology. As every agency the FBI is not above making mistakes. It’s not above misinterpreting. It’s not above inadequately simplifying.

On the surface it’s a little different with the United States Department of Energy, though it may surprise some.⁸ Again we have an agency that had not been created specifically to investigate courses and routes of viral outbreaks. The DOE does, however, oversee a large amount of science- and tech research as part of its United States Department of Energy National Laboratories and Technology Centers.⁹ So while the DOE is best known for its management of both the U.S. civilian and military nuclear programs, it certainly is in the context of the COVID origins investigation a main source of resources.

As with the FBI and any other agency this investigation comes down to individual specialists, i.e. virologists and genome researchers – the latter research is a directive of the DOA. This part of the equation remains a debate between the researchers commissioned by the respective agencies, it’s far from over, as the contradicting opinions forwarded by other institutions testifies.

As for intelligence gathering in a country like China the DOA seems really ill-equipped. The best one can guess is that the responsibilities in the U.S. nuclear weapons program requires a working relationship with intelligence agencies in regards to other nations, including China, a nuclear power.

The outright intelligence agencies which fall under the heading of National Intelligence Council.¹⁰ It’s a list of 17 member organisations, 18 if we divide between the National Security Agency and

6 A BBC article that, while still keeping the headline focused on the FBI’s view, offers a more even look at the involved agencies:
<https://www.bbc.com/news/world-us-canada-64806903>

7 See → 3.

8 <https://www.energy.gov/>

9 https://en.wikipedia.org/wiki/United_States_Department_of_Energy_National_Laboratories
<https://www.energy.gov/national-laboratories>

10 <https://www.odni.gov/index.php>

the Central Security Agency, and it includes the CIA.¹¹ As for relevance in the investigation into the origins of the COVID pandemic the significance of these agencies will vary respectively, but combined that's quite an amount of intelligence resources.

The NIC has come forward in favour of natural zoonosis as a better explanation for how this pandemic began.

Each of these organisations heavily rely, besides their own intelligence-gathering qualifications, on the expertise of individuals who've dedicated their lives to the study of medically significant pathogens. Many of the best qualified among these have their professional homes outside those agencies. Whether the specific individuals commissioned by a respective agency, whether belonging to the agency in question or not, is the best possible choice is a matter of revision, and counter-indicative findings must in any case be respected. The 'medium-' and 'low confidence' attributes are not only credit, they're at this point also still inevitable.

Our most adequately preoccupied minds are still in the process of understanding this virus. We're still learning about it.¹² With novel strains of virus this is no surprise at all, and as hard as it might be, as much as we want answers now, patience is the virtue in demand. You can't just demand answers. You need to allow the work.

In our current geo-political climate additional strains are already in place. Before we exacerbate them in any way, we better be damn positive. Once again, until we are, I'd rather have every one of these agency keep it in.

Meanwhile, since it is being discussed, and since the possibilities *shall* be entertained, arguing from a basis of actual information is, as always, imperative. This goes for the public as well, and also for the news-outlets reporting on the issue. News-outlets could be of help here, in fact. Instead a number of key-factors that may help a confused public to reach their own informed vantage points from where to orientate are frequently underplayed, recede into the background, if they're mentioned *at all*, despite their significance in all considerations making them *mandatory* information.

3. Zoonosis

A frequent conclusion one will arrive at after engaging in or witnessing a few exchanges between members of the general public, neighbours, fellow café customers, friends and acquaintances, but also, lamentably, when watching panel debates on the small screen, is that there are a lot of people who appear to have a problem with the very notion of zoonosis, of the transmission between, as it concerns us here, one or more species of animals and our own species. It seems that the principle challenges the intuition of these individuals, triggering instinctive scepticism. Given this frequency we're potentially talking a significant portion of the population.

This is further added to by people, who may understand the gist of it, but on a superficial enough level that causes them to dismiss it, to not give it much thought, even though now would be a good time.

11 https://en.wikipedia.org/wiki/United_States_Intelligence_Community#List_of_members

12 As one single example of countless for how much there's still left to be understood a paper on observations of what is known as 'silent hypoxemia' is worth reading -
Tobin et al - Why COVID-19 Silent Hypoxemia Is Baffling to Physicians:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7397783/pdf/rccm.202006-2157CP.pdf>

This must be countered by a few not-so-fun facts.

- Zoonosis occurs *all the time*.

And this is not meant in any way euphemistically, as in ‘often’, ‘very often’ or ‘really often’. You’re to take it verbatim. All the time. Perpetually. It’s likely happening in this very moment.

It’s just that in the vast majority of cases we’re not interested, as they do not involve *us*. There are a *lot* more other species sharing this planet besides us, and for viruses they matter just as much. It could be said that if you are a species, any species larger than a virus, you’re a potential host for a virus. That’s what viruses *do*: widen the range of their environment. And not only is the transfer of a virus between different species *common*, a virus’ adaptation to a new species, i.e. a new host as serving its purpose, is also common. And with that so is a health impact, meaning a new host, a new species becoming ill, developing symptoms.

- Zoonosis thus *will* occasionally involve us

The still existing and still powerful yearning on behalf of some to see us as anything special within the kingdom of life on Earth notwithstanding, biologically, and that’s what matters, we’re not really that different at all. All life on this planet shares common ancestry, we’re all related. The closer this relation is on the family tree, the more we’ll have in common. In the context of viruses this means the easier will be the adaptation. All mammals share a number of organs and their functions, and a number of other groups join in. Mammals and birds and amphibians have kidneys, lungs, livers and reproductive organs. They all have brains, nervous systems, they have blood vessels, they have muscle fibres, and they have nostrils, pores, mouths, eyes and other gateways.

For a virus the key in adapting to a new host lies with – keys. Enzymic master-keys distributed around their physiology. The closer we’re related to another species the greater the possibility for genetical similarities close enough for a virus to ease getting the key in, i.e. to succeed in the process of overcoming the genetic hurdle – a chimpanzee is more likely to transmit a virus to us and causing a health problem (i.e. enabling the virus to crack into a cell to multiply), and vice versa, than a gecko, and much more likely than an ant. But viruses are very, very good at solving transmission problems. They’ve been at the project for millions of years.

- You’ve encountered zoonosis before

In fact, the case can be made that not only most of the viral infections you’ve ever heard of, some of which you may have experienced, but possibly, perhaps even probably *all* of them have found their way to us by means of zoonosis.

Those we don’t call zoonotic have not led us to finding their origins as having been transmitted by another species, they appear specialised in humans. That doesn’t necessarily mean that it hadn’t begun for us like that. Rather we’re looking at dead end alleys in those cases. One of those viruses would be polio, which is naturally only seen in humans. However, it’s not a new disease. While the first clinical description was undertaken in 1789, references date back to ancient Egypt, the pyramid days. It is safe to say that no one had been capable of genetically engineering a new virus back then, neither in the latter 18th century nor the era of the pharaohs. We simply don’t know how it started. Which therefore cannot exclude the possibility of a zoonotic transmission that would subsequently lead to the virus specializing itself in one particular, for the virus highly apt host – us.

Many of the most known medically significant viruses are known to you as zoonotic viruses, too. The HI virus, cause of AIDS in humans, which began for us with a chimpanzee to human transmission.¹³ As mentioned, a virus will have lesser work with jumping from a chimp to us, as chimps are our closest relatives.

Many flu viruses that affect us can be traced back to other species.

Measles have evolved from cattle plague, aka Rinderpest.

13 https://en.wikipedia.org/wiki/History_of_HIV/AIDS

Ebola is a zoonotic disease, and can be found in other primates.

Any other viral diseases that can't be traced back to transmissions from other species with confidence or at all have us share the margin of ignorance we have with polio.

It should also be mentioned that it's a two-way principle. Remember the reports on pets and zoo-kept animals that have been infected with COVID by us.

And in case there's still some grey area here...

- Among the zoonotic viruses there's a sledgehammer virus

And you all know it. Though, and it's very concerning, ignorance about the specifics of this particular virus, despite the terror it has wielded across the centuries, is far from being rare.

It has many names, just like the devil. Names across the languages, but also within a single one, including being simply named after a symptom, a phenomenon, that is unique to it, hydrophobia. That rabies is being transmitted by bite is, in terms of an organism being infected and developing symptoms, *incidental*, it's part of the specific path of strategy employed by this virus. What matters are as always the enzymic master-keys that enable the virus to invade the cell, not the path of entry into the body – you will inhale, absorb or otherwise take in pathogens that cause disease in other species, but which will not harm you in any way, because the viral or bacterial agent in question hasn't solved the puzzle that is you as a bunch of cells (*yet*).

What concerns us in terms of zoonosis when it comes to rabies is that you can get it from a dog.

You can get it from a mouse. From a squirrel. A bat. A deer. A racoon. A rabbit. A chinchilla. What all these species have in common is that they're mammals. You're a mammal, and you'll get ill with rabies when you're bitten by another mammal that has the virus in its saliva and haven't received the vaccine, once you'll develop symptoms you will die, and in most cases it's one of the most horrific ways to go. And yes. You *are* a mammal. Pre-COVID figures testified of annually between 30 000 and, according to the CDC, nearly 60 000 humans still dying of rabies.¹⁴

Rabies viruses have specialized in mammals, and all of them. If you're mean-spirited enough you could give rabies to a dolphin. To a whale. All mammals are target. That makes rabies *the* most zoonotic disease on the planet.

- Chances for catching a zoonotic disease are on the increase

A virus that can or already has evolved into using us as hosts is only half of the equation of what enables such a jump. The other, a prerequisite, is proximity. Which of the two is the egg and which the vector hen, if you forgive me, depends. If a virus has already made a chimp its habitat not much is needed when coming into contact with a human. Too closely related, too similar. With chimps and the other great apes beside us you can already have a virus informed enough before it comes to an introduction between the virus and us; much is pointing to this having been the case with the HI virus.

More common is a give and take: close proximity between humans and other, including normally wild and distant species, serves as a scouting playground for microbial swapping, at first without incidents, eventually with a bug having learned enough from these exchanges to having adopted to us. Not much that stands in its way. Again, we're not that special.

Another group of animals that are still close enough to us to enable quick adaptation are pigs. We have quite a deal in common with pigs, and pigs have been domesticated, not as often as pets than as food, and they're regularly kept in bunches. Pig farming, especially when in yet another type of proximity with wildlife, is virus city. The same goes for any of our activities that involve cramming together other animals, including, and indeed and very much so, wet markets.

Wet markets increase the problem by adding species that are not already commonly bred and sold in captivity, animals that already live in close proximity with us by design, but animals that are often taken directly out of the wilderness and onto such a market, where they're caged, often along with

14 <https://www.cdc.gov/rabies/location/world/index.html>

many of their fellow captives within minimal enclosures, and often right next to still other species, and all that with a constant flux of humans around them, sellers and customers, leading to often repeated physical contact. It's not at all surprising that it may come to a jump from one of these species to ours. With enough time it's pretty much guaranteed. Wet markets are zoonosis factories. They are incredible good suspects when it comes to determining the origin of an outbreak. That other type of proximity between humans and wildlife is also actively inflicted – on the wildlife, and also self-inflicted. Wildlife has a decreasing amount of places to go. While by far not the most numerous of species in individual numbers, we are the most impacting (besides certain microbes). Deforestation, expanding farmland, growing cities are factors contributing to habitat loss of a huge number of species. Making swaths of land uninhabitable by poisoning it is an addition. A too fast changing eco-system as a result from all this – some species temporarily benefiting and causing havoc among others – another. Food-, water- and ice-scarcity as a consequence of the warming climate and resulting in less prey, yet another. The widespread loss of habitat of a vast and growing amount of species for the benefit of one inevitably leads to increasing contact, and the first contact is generally that between wildlife and the animals we keep.

What is a virus?

A virus is a being that is so simple that many among those interested in them deny them the prestigious title of life. Others suggest that we may want to expand the definition a bit. There's a good argument to be made that viruses compare to the first replicators, the first step risen from organic molecules that would give way to the most primitive microbial life billions of years ago. They don't have a metabolism. They don't have a central nervous system. They consist of a wad of RNA – most commonly, though there are some with DNA – a couple proteins around, all bunched and surrounded by a membrane of varying thickness, or none at all, and on their surface enzymic spikes that, if they're fit, if they're made to fit, enable them to make duplicates in a cell. That's it. That's your virus. Wad of RNA, proteins, spikes. It doesn't get any simpler. Compared to a virus any cell is a wonder of complexity.

Viruses are also small. Real small. Sizes vary, and there are some exceptionally big ones, when seen relatively, commonly when a virus meets a bacterium it'll see a real big whale. Or not see, for they also don't have eyes.

Despite this simplicity, or perhaps because of it, viruses are enormously successful. Most of them are perfectly harmless to us, in fact almost all of them. Compared to the number of species of virus that exist on Earth, that's species, not specimens, those that can and do become medically significant to us are a virtual handful. Many of those that don't are outright helpful. You have at any given moment quite a number of species of virus in your body (that's also species, not merely specimens), doing good work for you. Some viruses are promising in the fight against other diseases, best known are phage as an alternative for antibiotics in the combat against bacterial infections – the increasing resistance of harmful bacteria against our most powerful weapon against them is yet another problem we're facing, and it's one that might be even more dangerous than viral pandemics.¹⁵

Those viruses that do cause us harm can do it immensely. Viruses do adaptation on speed. And with often baffling results. Just what a high mortality virus can accomplish is exemplified by the rabies virus.

The rabies virus enters the mammalian body by means of a bite. Different from other viruses it isn't interested in our blood vessels as a means of transportation. You will find it in the blood along with anti-bodies because blood vessels will be damaged. But the virus strives to get into the severed nerves. It's the nerves it'll travel along, destination brain. This route is serving two purposes: the

¹⁵ <https://en.wikipedia.org/wiki/Bacteriophage>
https://en.wikipedia.org/wiki/Phage_therapy

virus evades the mammal's immune system, and it also circumvents the blood-brain barrier, a border check before the brain that prevents many pathogens from entering the brain from other parts of the body.¹⁶

The journey can be long. It can take weeks, months, in a few rare cases even years for the virus to reach its destination.¹⁷ The bite area plays a role, a bite on the neck means a shorter way than a bite on the toe. The vaccine must be administered before the virus reaches the brain. Once it does, with the onset of first symptoms, the mammal in question is dead while walking – rabies symptoms mean the highest mortality rate among viruses: 100%.¹⁸

What the rabies virus exactly does in the brain is still a matter of wonder and debate. It's a common mistake to think it wants your brain to swell up, encephalitis is more probably down to response than the virus itself. It's another common mistake to assume that the rabies target-focuses on areas of the brain responsible for violent behaviour. The so far most convincing hypothesis is that rabies try to affect as much as possible of the brain, that the aim is to overstimulate the brain, which compares more to an archer not merely shooting an arrow at the target, but throwing arrow, bow, quiver, coach and a good portion of the shooting range at the target just to make sure.

The result is a body-whole effect, and with the body also of the moods. Increasingly painful cramps and spasms until it's agony. Increasing loss of motoric coordination. And increasing emotional chaos, rage and fear. The idea that it's only rage isn't reflected in the human experience, nor is it the only emotion on display with other species. What makes an infected dog so dangerous is that it, afflicted with pain and fear, will seek the help of its owner, only for an emotional ricochet to result in it biting the owner. Eventually all this will culminate in the familiar image of rabies: intense spasms, utter confusion, fear, immense looking rage. A human in late stage aggressive rabies will produce sounds you won't identify with being human. And perhaps the worst, from humans we know that the patient remains lucid in between the worst, fully aware of what is happening.

There is one other area in the mammalian body the virus seeks out, the saliva glands. And not only does the virus want to be present in the saliva, it wants as much of the saliva in which it is present as possible to be present in the mouth of the mammal. In order to achieve that it – *somehow* – has a rabies-unique symptom manifest itself in the victim. Hydrophobia. Hydrophobia causes the victim's

16 https://en.wikipedia.org/wiki/Blood%E2%80%93brain_barrier

Incidentally, the virus causing COVID also seems interested in our brain (also see → 12), and has found a different way to handle our blood-brain barrier, and it's related to the reported loss of taste and smell that can occur with a COVID infection. A paper detailing findings on this can be read here - Achar & Ghosh - COVID-19-Associated Neurological Disorders: The Potential Route of CNS Invasion and Blood-Brain Barrier Relevance:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7692725/pdf/cells-09-02360.pdf>

17 Giesen et al - 30 years of rabies vaccination with Rabipur: a summary of clinical data and global experience:
<https://www.tandfonline.com/doi/epdf/10.1586/14760584.2015.1011134?needAccess=true&role=button>

18 There have been reported cases of humans surviving rabies after having developed symptoms, most famously Jeanna Giese, who, after having been bitten by an infected bat, developed symptoms and entered the first trial of the Milwaukee Protocol, which had the treating personnel induce a coma to relieve the brain of the stress imposed by the virus – the idea for it was developed by Dr. Rodney Willoughby Jr. in response to Giese's infection and was based on the hypothesis of the overstimulation of the brain by the virus, with the treatment possibly confirming this hypothesis: Giese survived with comparably minor neurological damage.

Since then there have been other cases of patients reportedly surviving due to the protocol, but they are still exceedingly rare, the outcome of the protocol is uncertain and debated, and also complicated:

https://www.mcw.edu/-/media/MCW/Departments/Pediatrics/Infectious-Diseases/Milwaukee_protocol.pdf

<https://www.esanum.com/today/posts/the-milwaukee-protocol-is-applied-on-a-human-rabies-case-in-the-usa>

There's also the possibility of Locked-in Syndrome as a result of the chemically induced coma; when compared with the normally expected outcome of rabies, an excruciating death, this danger ought to be subject for the debate about clemency euthanasia with the patient's consent, e.g. given before the protocol.

There have also been reports on finding signs of exposure among humans living in the Peruvian Amazon -

Gilbert et al - Evidence of Rabies Virus Exposure among Humans in the Peruvian Amazon:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3414554/pdf/tropmed-87-206.pdf>

Despite these very rare cases, in the context with up to 60 000 annual human deaths the mortality rate of rabies after the development of symptoms still has to be valued as 100%.

throat to violently spasm whenever this victim is presented with liquid to drink, with water. In most animals, but also in human children these painful spasms will quickly combine the discomfort, speak pain, experienced when seeing water with the water itself, making the water also a psychological cause for pain – hence the name. This ‘throttling’ is so severe it’ll deter the mammal from drinking, and it will naturally grow increasingly thirsty. More throttling. More saliva that cannot be swallowed, thus collecting in the mouth. The infamous frothing mouth. And it’s the mouth, the snout, because for most, almost all mammals, the focus when on defence or attack lies with the snout, there are the weapons, the teeth. With the virus present in an abundance of collected saliva and the mammal weaponized by over-inciting fear and aggression along with everything else – the cycle is completed with a new bite.

Pretty elaborate for a being so simple we don’t even allow it the title ‘life’. Wad of RNA, some proteins, spikes.

This extreme example of a virus making a whole complex organism its instrument serves to show the lengths of which this simple being is capable of. But rabies is a bad candidate for a pandemic. Ebola isn’t a good candidate either. Exceptionally high mortality rate doesn’t make a good mass killer, with the prospect of pandemics the rule for potentially life-threatening viruses is: a lower mortality rate will kill more people.

Highly infectious, not too high a mortality rate, long enough incubation period to ensure broader transmission by means of more than one host. That’s the formula.

The bottomline is that we already have a fertile ground from which medically significant viruses rise outside the laboratory: the world. Rise and adapt, and adapt to jumping from one species to others, widening their environment of hosts. Our current behaviour only assists them in the endeavour, before and during an outbreak.

What makes this much bigger laboratory, the world, an even more potent candidate is that the wilderness, and to a virologist that’s everywhere outside the lab, the wilderness is also something lacking that is provided by the actual research laboratory.

4. Labs

None of all this means that it is impossible that the COVID-19 pandemic originated in a lab leak. It’s not. There’s always a possibility, always a remaining risk, predominantly of a mistake being made. An undiscovered perforation in the protective gear. A mishandling of a vile. A minor violation of safety protocol. A laboratory tasked with the research into potent pathogens has some nasty bugs in storage.

A couple of points should be considered before making a preference for a lab leak as the cause for the COVID pandemic without concrete evidence.

A few years before the outbreak the World Health Organization published a list on its website. It was meant for everyone. Lawmakers, world leaders, and for everyone belonging to the general public. Out for everyone interested.

Most people weren’t interested enough to even look for it. Most people didn’t even infrequently visit the website of the WHO. Which is already a little disappointing, given that global health crises aren’t anything new. It’s worth a study: a ferry capsizes, more than 40 deaths. A tragedy. And it is. A chemical plant explodes, more than 200 deaths, a catastrophe. And it is, and it’ll govern the headlines for a while. A single death as the result of a shark attack, most likely due to blood loss-related drowning, and shark incidents being dwarfed in numbers by killing fridges, our thoughts are with the relatives, and we prepare ourselves for the idiotic demands of culling. 14 dead in a

highway mass collision, and yes, it is a tragedy, 20 000+ dead from H1N1, ‘WHO, why are you creating such a panic?!’

It appears that if we only spread numbers over a wide enough time and area, and if most of these numbers remain hidden in ICUs and morgues, people seem to have less of a problem with it. Seem less inclined to view it as a tragedy. Maybe it’s just too much. But we’ve seen and heard people denying a COVID death number approaching 8 million.

The list published by the WHO on its website years before the COVID outbreak was one of candidate pathogens, including viruses, for a coming pandemic, microbes that could potentially cause a pandemic in the future. Among them, and those of you who don’t know yet, brace yourselves, among them was a group known as coronaviruses.¹⁹ Strains belonging to this group had already caused outbreaks elsewhere in the world.

Again, meant for everyone to read. No knowledge hidden from the public here.

When word is of ‘*the*’ coronavirus, ever since the first days after the outbreak, it’s imprecise.

‘Coronavirus’ describes this particular group of viruses. There are more than just this one virus that fall into this group. What was novel was the strain, then adapting to variants. COVID-19, finally, is the disease caused by the virus, its complete name being severe acute respiratory syndrome coronavirus 2, or SARS-CoV-2.

But the group was known. If you didn’t know that and now ask yourself how the WHO could have known enough about at least the group to warn us this early about the possibility that a member of this group could cause a pandemic, you’re asking the right question, and it’s integral to this section.

One thing that you wouldn’t have found in relation to this list was any notion that the warning referred to a possible laboratory leak. Lab leaks were not what was on the minds of those compiling this list. They knew perfectly well that a lab leak isn’t necessary for a pandemic to be caused by any one pathogen on that list. A lab isn’t.

The possibility of a lab leak will appear soon in the conversations, already before the involvement of any government agencies, long before any investigation. One reason for that falls under section 5. Another reason is that it’s more exciting. It’s more exciting because it has a familiar narrative, we know it. Only this time it would mean it’s for real.

We have been primed by our fiction. Fiction does that, and we shouldn’t underestimate the effect. It does so in other areas as well, it sure does when it’s about the threat of pandemics. Make your own list of movies and novels featuring the end of the world by virus. It’ll be mostly movies, I guess, and for good reason, too, we’re very visually orientated beings.

19 I decided to go forward with the account of having found this list years prior to the COVID emergence despite having been unable to find it again amidst the data available on the WHO’s website, the amount of which is massive while search options are not as optimal as they perhaps could be, and the requirements for accessing archived material I find a little excessive. Until I have rediscovered this list I can link to a 2017 report published by the WHO that already made mention of a coronavirus as MERS-CoV (page 2): https://cdn.who.int/media/docs/default-source/blue-print/first-annual-review-of-diseases-prioritized-under-r-and-d-blueprint.pdf?sfvrsn=1f6b5da0_4

The point is, the group was known and understood to pose a substantial threat.

The Rage in '28 Days Later' and its follow-up, created in a lab.²⁰ Stephen King's 'The Stand', weaponized influenza from a lab.²¹ '12 Monkeys', a mad assistant spreads a virus from the lab where he works.²² 'Warning Sign', secret lab.²³ The list goes on.

There are exceptions, the most notable and laudable one being Steven Soderbergh's 'Contagion', which gets a real lot right (favourite quote, 'someone doesn't have to weaponize the bird-flu. The birds are doing that.').²⁴ It is a researcher in a lab who saves the day and a lot of humans with it in this film.

But a good number, if not the majority of virus-related disaster stories pick the lab as the place where it all goes wrong. More dramatic and more chilling, because we can actually look at faces that cause it all.

We have this background of cultural priming, now we add the necessity of safety measures that make a research laboratory an inaccessible place for the rest of us, and finally we remind ourselves that the very purpose of these labs means that they have highly dangerous bugs in there, and ideas and stories and rumours and myths of biological warfare, especially given that the subject of biological warfare has a real justification, will do the rest. The result is:

The *Lab*. That nefarious place.

Jon Stewart didn't exactly help.²⁵

Which brings us to two important questions:

- why do we have them?
- how likely is a lab leak, especially when compared to zoonotic transmission outside any lab?

At the beginning of the COVID pandemic I was listening out for a word. A short word, out of a choice of two short words. I expected to hear it, to read it, yet when it came I was still relieved. The word was 'when'.

Say you're catching a cold. Common cold, you just caught the Rhinovirus. What do you do?

20 28 Days Later, 2002, written by Alex Garland, produced by Andrew Macdonald, directed by Danny Boyle, & 28 Weeks Later, 2007, written by Rowan Joffé, Juan Carlos Fresnadillo, E. L. Lavigne & Jesus Olmo, produced by Enrique López-Lavigne, Andrew Macdonald & Allon Reich, directed by Juan Carlos Fresnadillo

21 The Stand, by Stephen King, 1978, published by Doubleday, ISBN: 978-0-385-12168-2

22 12 Monkeys, 1995, based on La Jetée by Chris Marker, written by David & Janet Peoples, produced by Charles Roven, directed by Terry Gilliam

23 Warning Sign, 1985, written by Hal Barwood & Matthew Robbins, produced by Hal Barwood & Jim Bloom, directed by Hal Barwood

24 Contagion, 2011, written by Scott Z. Burns, produced by Michael Shamberg, Stacey Sher & Gregory Jacobs, directed by Steven Soderbergh

25 The otherwise formidable and usually better informed Jon Stewart appeared on Stephen Colbert's Late Show for a dramatic rant:
https://www.youtube.com/watch?v=sSfejgwbDQ8&ab_channel=TheLateShowwithStephenColbert
Rewatching it, I'm still not a 100% sure if this wasn't a bit, but confusion over it already implies that as a comedic bit it would have backfired. Whether meant satirically or expressing Mr. Stewart's view (as it appears), the rant, particularly in Mr. Stewart expressing the fear over scientific curiosity one day killing us all, represents a misunderstanding and misrepresenting of the purpose and necessity of these labs, as well as it neglects the plausible possibility of zoonotic transmission.
I have no information about whether Mr. Stewart currently still holds these views, or whether, after more introspection and considering available information, he might have reversed them.

You're eating vitamins, lots of fruits, veggies, that's good. You should always eat your greens. Will it help? No. Timing-wise that's already difficult to see, you've eaten pizza and lard all your life, now you feel a little down, must be a cold, let's eat some fruit, bang, all good. Not how that works. Eating healthy will probably help your immune system, but over time, it's not Getafix' magic potion, and anyway, the premise is that you now *have* the cold.²⁶ What else?

You're drinking tea, green tea even, very good, much better than the quantities of coffee I consume. Will it help? No. See above, also not a magic potion. Not even if you put honey in it.

Hang out your room with garlic? Sure, knock yourself out.

The reason why you think the oranges, apples, honey melons and green tea work is the same why homeopathy saw its dawn in the late 19th century, while virtually being peddled right next to Dr. Tumblety's Magic Potion for Everything at first.²⁷ At a time when bloodletting was already outlawed in many places but still being practised, a time when the latest in medical treatment could still makes things worse for you if you suffered from an ailment that would blow off all by itself otherwise, getting a pill or potion that had literally *no effect whatsoever* would often be the healthier thing, and so the impression grew, you had something that would get better by itself, you took your magic potion, and right, must be the potion.

When you come down with a cold what you feel much more than any effect the Rhinovirus could have on you (unless you're immune-compromised) is your immune system's response. What you feel is the battle raging. What you feel is the battle already being won.

It's a brief illness, with all the major symptoms consisting of excreting something that's not supposed to be inside, and the best thing you can do is assisting yourself with rest, and you'll do that anyway. Your immune system is familiar with the Rhino, and it'll deal with it. Kick back and let it pass. Within the same time frame, whether or not you'll stuff yourself with bananas.

Or in other words, we're extremely lucky when it comes to the Rhinovirus.

Lucky that it's such a mild one. Lucky that our immune system can deal with it. Lucky, because besides this virus being a really highly infectious one, and besides there being no need for getting sick from tons of grapefruits, it's not only that we don't really have a remedy, we also have no vaccine against the Rhinovirus.²⁸

Certain anti-viral drugs have shown promising effects lately, and there's some hope that we're on the way to a vaccine, again, and again, but as of now there still isn't a vaccine. And not for a lack of trying. Finding a vaccine should not only make the person who does a contender for a Nobel Prize, there's a serious concern behind this.

I'm dabbling in science fiction, the only true distinction being that in scifi the What If is given greater liberty and range. And one may ask oneself about the relative harmlessness of the Rhinovirus – what if that should one day change?

After all, viruses are adaptation masters. They don't *want* to kill you, it's just that for some of them killing you is an incidental by-product on their strategic map. And whether a virus becomes lethal or not is pretty much down to a game of dice called adaptation by mutation.

Picture a virus as contagious as the Rhinovirus. With a long enough incubation period to allow the spread to several others by a single person. With a mortality rate not too high, but severe enough. And, with no vaccine available. Not even on the horizon. If it would be something like the Rhinovirus we'd know that, because we've already been trying for decades, and what you think the chances are that after all this time we'd find it right then? It would mean that all the safety measures

26 https://en.wikipedia.org/wiki/List_of_Asterix_characters

27 https://en.wikipedia.org/wiki/Francis_Tumblety

28 There are options of antiviral drugs that have recently been developed, especially applicable in severe cases caused by impairments of the immune system, and frequently messages of hope for creating a vaccine against the Rhinovirus reach the news; as of now we still don't have a vaccine:
<https://en.wikipedia.org/wiki/Rhinovirus>

such as they'd been imposed during COVID lockdown, ranging from annoying to devastating in themselves, depending on country, they would last *indefinitely*. They'd be much sharper. Not mere pleading to stay at home, but curfews. Essential places will become not so essential, supermarkets may close, too, food being delivered by figures in full hazmats.

Should the short word be 'if'.

If we'll find a vaccine.

The same could be the case with a totally novel virus, not just a novel strain, but a hitherto unknown group of viruses.

The word turned out to be 'when', and for good reasons. Remember the warning list the WHO had published? The group called coronaviruses was known, known and understood enough that the 'when' could be used with some confidence.

This is really crucial. One day enough among us will perhaps understand that while we rightly applauded the hospital staff for their immense, self-endangering labour, that while we heaved an appropriate sigh of relief when the first vaccines had been developed, we should also thank the soldiers in the first trenches – without the work of the researchers in those 'nefarious' labs the developing of a vaccine would not have been possible, least of all this quickly. And this work reaches back across years and decades. These labs exist in order to make the 'when' more probable than the 'if'. They exist to understand viruses, and with this understanding to arm ourselves against them, and where we can't yet, to at least prepare us. Without these labs you may think medieval plague. Meanwhile people might want to consider it before going on their next rant about scientific curiosity one day killing us all. Looking at you, Mr. Stewart.

The need to study pathogens naturally necessitates that those pathogens will be present in the respective lab. And the researchers are humans. The combination of these two presences, dangerous pathogens and humans, opens up the possibility of mistakes that can end badly. Yes. Absolutely. And once again, if it turns out that it this pandemic began with a lab leak in Wuhan we must accept it, and we must act accordingly.

Act how?

I hope nobody will suggest that we should close down all the labs if it had been a leak. I say I hope, though I know there'll be some. Angels and ministers of grace defend us.²⁹ That'd be like killing all the physicians because you had one bad experience with a doctor. The bad news here is that we have a history of not only shooting ourselves in our own legs occasionally, but sawing the whole thing off entirely.

Naturally an enormously high level of safety measures must be in place and maintained. Adjusted where necessary. Mistakes must result in parties being held accountable, and then those in charge must learn from them. There's always the chance of an accident. There's also always the question of alternatives, if you have any in mind.

Regardless of what your personal response to the possibility of a lab leak may be, here's something you should seriously consider:

the laboratories in question already have a strict system of safety measures in place. Some of the movies get this right. Several degrees of security, depending on what pathogens are being handled, background checks, decontamination procedures, and of course protective gear and clothing, all the way to the hazmat suits on our minds. To the suits that look more like vessels, with air-tubing and all, gloves triple-fixed with tape, everything triple-checked upon entering and leaving Level Real F****ing Dangerous. Can something still go wrong? Of course.

Meanwhile, compare this to the Wilderness. To everything outside those labs. To the jungle, to the steppe, to the spots in the city where we may come in contact with other species that, unbeknownst

29 William Shakespeare, *Hamlet*, Act I, Scene 4,

to us may carry a bug that might jump over to us. To the wet markets. To every place that's part of our world and that's not one of these labs – no safety measures. None at all.

At this point you need to do your homework. By all means, don't just take it from me. Educate yourself, and see if I'm right about the laboratory called Earth, about the Wilderness already containing plenty of potentially hazardous microbes that are a serious threat to us. That can jump over to our species. We're the only species that *has* hazmat suits. Monkeys and apes and pangolins and possums and birds don't have them.

Do this, and find your own equation, but be diligent. Which of the two provides the bigger threat, the greater potential for a spill-over, the massively safe-guarded and -guided lab that is needed to understand these threats and to work on our behalf, or the 100% unprotected wilderness?

5. Blame

Besides the priming, the rumours, the fantasies, the misinformation, the lack of information, another factor for the preference for a lab leak over naturally occurring zoonosis is that we need a culprit. When something terrible happens we need someone to blame. And with Nature this is notoriously futile.

A lab leak would mean a mistake, a human mistake, and point to one or more individuals having messed up, and perhaps the institution behind them before that. Perhaps even the whole state. Those individuals, the researchers, the lab's leadership, perhaps the government above them, these would all be persons on which blame could be heaped, if that's the case. Again, though, what's next? If such a leak would happen in a country like the U.S., Canada, the U.K., Japan, or the Netherlands, measures would be demanded and most likely taken, especially if a leak of another kind would reveal that the negligence had been institutional to begin with. But the pandemic began, no matter what, in Wuhan, China. It would be difficult to demand and monitor punitive actions as well as changes in policies, in safety measures, from outside China in times when diplomatic relations were better.

As they currently are, blame and demands would add to the already heated climate. China's leadership has shown itself to be quite sensitive in respect to allegations and accusations already, including well deserved ones. That's of course not to say that such demands, and such blame, would be inappropriate should it turn out that it was after all a lab leak. Just – make damn sure you're 100%. To repeat, 'medium-' or even 'low confidence' is not that.

In any case, it's not that there isn't already enough reason for blame. Beginning with the handling of the outbreak, and especially the initial secrecy about it, on behalf of the Chinese authorities. Beside such actions not at all being in the interest of the Chinese people, it stands to reason that a lot could have been different had the world known earlier.

That doesn't necessarily mean that they *would* have been much different. There's more blame to be distributed. To a large number of nations.

Whether or not a pandemic could have been averted had the Chinese authorities reacted sensibly in time is a matter of debate. Infectious diseases have an ally in us, we're not only hosts, we're also conspirators, just that we're conspirators with our dripping noses in the wind. We haven't got a clue that we are. Some of it is just the things we build. Our airplanes are not only transport for ourselves,

their arrival in history has been good to infectious diseases, making spreading not only easier, but exceeding the wildest dreams of any eager pathogen.

We should not automatically see malice or indifference in the catastrophic first decisions. Incompetence, yes. Wrong priorities, certainly. Overall, they were overwhelmed. And they might have been had they reacted better. This is not to downplay just how wrong and consequential their actions were. But with the first plane leaving with an unwitting COVID patient, the seeds were being spread.

The disastrous first decisions were then mirrored elsewhere, repeatedly, and much later, at a time when things had become crystal clear. Another way in which we assist viruses and other pathogens: sheer stupidity. You can do wrong and still blame, I'm not a fan of the first stone to cast-parable when it comes to words, it's good in terms of stoning, that's about it.³⁰ But the fault quite quickly no longer lay with China alone. Pointing a finger isn't enough, and will look embarrassing, if you as a leader outright deny the existence of what is ailing and killing countless people around you.

The maps weren't surprising. How well or bad a respective nation did depended entirely on how serious the authorities took the situation, on what restrictions they imposed, often as unpopular choices, and on how the people of the country in question upheld them. New Zealand did relatively well because it had good leadership. Lockdown was a lot stricter than in many other countries, borders were closed, masks were mandated, tests were made available. Don't be misled by New Zealand being an island nation and thus perhaps being better protected by natural borders such as the sea. So is Great Britain. So is Japan.

Bad leadership combined with blind trust in this leadership due to misguided ideology, even in the face of the most ridiculous ideas on behalf of this bad leadership, will lead to a bad outcome. A map of the states and areas in the U.S. that are overwhelmingly populated by Republican voters has been compared with a map of the most COVID cases, and the contours reminded of the respective other.³¹

Leadership, good or bad or anything in between, isn't all. Personal responsibility is equally decisive. A whole other text of this length, a whole book can be written about the wide swaths among the world's population who are in apparent need of the lesson about how to distinguish information, how to best divide the gold from the bullshit, and it's a principle one could convey to a 5 yr-old. Besides the flabbergasting lack of interest in getting adequately informed that persists in many to this day – ask any hotly debating flock for a show of hands, who among them can explain to you what a virus is, then ask them whether they don't think that this is just a *little* strange; what did we have on Youtube, 'learn how to make sourdough', good, I like sourdough bread, what else, 'learn origami, time will fly', should it, though? Or, 'listen to celebrities singing "Imagine"...' How about learning what a goddamn virus is, how it works? You know. The *thing*? I mean, it's been *years* now.

Besides this, one thing that stuck out in a particular unpleasant manner was the inherent egoism in the, usual loud, demands for having one's own personal rights and liberties respected. Whether that was expressed by an individual or a protesting mob, of either the professed right or left, in action they became indistinguishable.

I got news for you, pals, and that's outside any given executive order, but your perceived right and liberty to go where ever you please and when, and without a mask and washed hands, it does not supersede or value more than the next person's right to remain healthy and *alive*! It does not. During

30 VA – The Bible, John 8:7

31 Such maps can be viewed here, for example - Gollwitzer et al - Partisan differences in physical distancing are linked to health outcomes during the COVID-19 pandemic:
<https://www.nature.com/articles/s41562-020-00977-7.pdf>

a pandemic you *don't* have this right. If we'd all know what to do and then do it, we'd do it without mandate. The mandate is foremost for *you*. It's in place *because* of the likelihood of someone like you.

What is a pandemic?

A pandemic is a catastrophe. Just like a volcano eruption near to a settlement is, just like an earthquake is, or a large asteroid impact. Like a capsized ferry and a house fire are. Remember the difference in attitude and reaction? It's just that in our eyes a pandemic moves a little slower. It will always cost more lives, with the possible exception of the asteroid impact, depending on the size, composition and porosity or lack thereof of the thing. If a volcano erupts in your vicinity, and the pyroclastic cloud is rushing towards your village, what would you think of someone demanding to stay seated and be served?³²

There is actually a historic case when something just like that actually happened, and it's discouraging for more than one reason.

When Mount St. Helens was about to erupt an 83-yr old man, who lived in a lodge in close vicinity to the volcano, refused to evacuate. All attempts to persuade him made by the rangers were met with defiance. He became a news item. Reporters drove to his cabin, a good story. The rangers drove out repeatedly to convince him to leave. It appeared he enjoyed the attention, but he remained stubborn. Meanwhile he became somewhat of a hero to a lot of people, celebrating him while he was still up there, still alive. Someone who stood up for his rights.

He was killed when the mountain blew. Pyroclastic flow, burying his lodge under over forty metres of extremely hot ash.

I have no sympathies for him. And I don't have any sympathies for the people celebrating him. The rangers, who's job it was to repeatedly drive out and try and convince him, did not force him out. They didn't drag him out. So there can be no talk of anyone violating his rights. They were trying to save his life. And they were risking their own lives trying. Volcanoes are hard to predict. Back in 1980 it was even harder. The same went for the reporters, who didn't have to go out there, but he was a story, and that's *their* job. What's there to celebrate, to admire? A stubborn old fool, endangering others along with himself. Learn his name from the footnote if you must, I say only remember him as a reminder of how much foolishness there is in the world.³³

We were badly prepared for the COVID-19 pandemic, and we were badly prepared despite there having been good knowledge and quite a number of voiced warnings, the WHO's aforementioned list wasn't the only. We were badly prepared because we didn't recognize the matter as a priority. A civilisation can be defined by 'the many who, together, manage to get their priorities straight'.

According to this definition we do not yet have the right to call ourselves one.

And the 'we' is to be taken verbatim. Our leaders' role is not to take all responsibility from us, it's not to turn us all into children.

So in fact, there is a lot of blame that can be applied.

32 https://en.wikipedia.org/wiki/Pyroclastic_flow

33 https://en.wikipedia.org/wiki/Harry_R._Truman

Incidentally, the WHO deserves some of it, too. Its director was still hesitant to call the pandemic a pandemic when it, by all definition, already clearly was one, and it wasn't helpful.³⁴ I have an idea why, I might be wrong here.

In the aftermath of the H1N1 pandemic, a 'smaller' pandemic, meaning costing fewer lives than COVID, but also meeting the criteria for being called one, a number of voices criticised the WHO, accusing it of panic-mongering.³⁵ The exact number of victims who died as a result of infection is unknown, the estimates that already exceed 20 000 are probably too low. But even if we count 'only' those 20 000 – those had been 20 000 lives, and the deaths occurred worldwide.³⁶ Has it ever occurred to those critics that the number hadn't been much, much higher because of this 'panic-mongering'? It is possible that the WHO's director had been reluctant to repeat a clearer warning after the experience? He shouldn't have been.

Much higher, as in almost 8 million, for example. At the beginning of the COVID pandemic, when the first facts emerged, I started to think of it as a dress rehearsal. The thought was later reflected by some in the public sphere. Now, after all those people who have died, and with so many still suffering from the long-term effects of this illness, and with still more dying, I still think of it this way. Because there can and probably will be a next one, and it may be still worse, perhaps much worse. A next pandemic as a 'when' not an 'if', but with a prospect for a vaccine that's an 'if', not a 'when'.

If the COVID-19 pandemic was a dress rehearsal, we flunked it. Only hope is that it'll be like with a theatrical dress rehearsal, it going all wrong probably means that the premiere will shine. Right, I forgot. That's actually a myth, too.

Blame is inevitable, and necessary, but it mustn't be a blame just out of a need for it, especially not as resulting from a preference, over one possibility that won't allow us blame, for it does not include a culprit.

In the meantime, with all this blame to be directed at so many, including each of ourselves, the prerequisite for blame is fault and mistake, and or and malignant behaviour. All of which should be incitement enough to make sure we'll do better next time.

Unfortunately, with this pandemic not even really over yet, the signs are again not exactly promising.

6. Weapons

It's been commented on how powerful the tendency is to rush back to normal as soon as it is possible. How strong the desire to forget, even events that have just concluded, even, as with this pandemic, before they have really concluded. Part of it can be observed by anyone on a personal

34 The WHO did not declare the COVID-19 crisis a pandemic before March 11th, 2020 – the worldwide spread had, by all criteria, met the definition before that. As late as early February 2020 the WHO's Director General Tedros Adhanom Ghebreyesus argued against a travel ban to China:
<https://www.reuters.com/article/us-china-health-who/who-chief-says-widespread-travel-bans-not-needed-to-beat-china-virus-idUSKBN1ZX1H3>

35 The WHO published a response to the criticism on its website in form of a review of the WHO's reaction to the H1N1 pandemic:
<https://www.who.int/director-general/speeches/detail/external-review-of-who-s-response-to-the-h1n1-influenza-pandemic>

36 https://en.wikipedia.org/wiki/2009_swine_flu_pandemic

level, you've been going through something painful, a back pain that didn't allow you anything, every motion was agony, and it made you miserable through and through, and as soon as it's gone, your mind is on something else, better, no need to dwell. You went through a rotten patch, or a couple nights stranded somewhere, it was horrible, but once it's over, it quickly is also over in your head. You move on. It's not only sensible, it's design (though that's a borrowed word). And we do that even with catastrophes. It's been long enough. The suffering, the restrictions. It's not only fatigue, it's just that we tend to shoo away all things unpleasant.

That'd be how not to do it in cases like this. That's a weapon designed to avoid the fight, to not know about its necessity.

With the old question about free will there's an angle that at least allows us to get a fix on it. Those who proclaim ourselves to be utter subject to genetic programming, denying the existence of free will altogether, are arguably just as intellectually lazy as those who deem their lives absolutely in their own hands, all their choices truly to be theirs. It's never that simple. The moments when we can dare to say we come closest to what may be free will are those when we choose to act against our grain. When we do something we don't want to do at all, but do it because we feel we have to. You mess up, you do someone an injustice, and you really, really don't want to go there and set things right, to take responsibility. Everything about you, every fibre ruffles and resists. And you do it anyway. Hopefully.

Cowardice, the reluctance to take responsibility, whether it's ornamented with any number of excuses, has always this aspect to it, the natural instinct to avoid anything unpleasant and painful. You go against this impulse, it certainly comes closest to what we can call free will.

The same goes for going against one's intuition. In science, and in astrophysics in particular, and in theoretical physics very much especially, that's become pretty much a state to stay. It's also what's required in learning from the terrible. Beyond the still wide eyes, beyond shock, certainly beyond numbness. The question 'what's just happened' must not remain rhetorical.

In terms of the COVID-19 pandemic, and of any pandemic to come, the arsenal of weaponry at our disposal consists of tools that are interlocked in one and the same room. They might intuitively not be that closely related, but since they concern us all, whether we're leaders and legislators or researchers in a lab or doctors and nurses or plumbers, painters and salesmen, each can either strengthen or weaken the other.

We can recognize vaccines as the strongest weapon we have against viruses, but if not all of us understand this, if enough of us deny this and pressure their elected leaders against them, or if they simply refuse them, then the whole effect of those vaccines is at stake.

This very discussion about whether the origin of this pandemic had been a lab leak or natural zoonotic transmission is highlighting that, even though research laboratories are at the very top of the list of weapons against pathogens – without the research no understanding, thus no vaccines – blindness before their needfulness will lead to suspicion against labs as such, and perhaps demands to cut funding, or even to shut them down.

We can learn how to behave in the eventuality of a pandemic, what to do and what not, but if not all of us do, then even a minority can be enough, just as with the single example of accepting a vaccine, to derail the effort. It's a safe assertion that this pandemic could have been cut shorter, and that it wasn't is to a good part due to individual choices. To be clear once and for all: if you refused a number of safety guides in favour of what you perceived as your personal freedoms as prioritized over the rights of others, and if you've done it to an extent that actively endangered others with exposure, there is a good chance that you are responsible for the death of another human being. It might not be someone you knew. It might not be someone who'd been geographically close.

We can have competent personnel to guide us, but if the details of what this guidance contains is then being politicized, if one political party and their media bullhorns choose defiance for gains that are unrelated to the realities of the disease, it'll be yet another derailment.

The same goes for any bogus cure that has the gullible deem themselves safe while keeping them endangered, and others around them, and for any bogus theory, be it concocted out of belief, ignorance or malice.

So it seems clear that each and every single common sense defence against the threat of pathogens with the capacity for global spread is dependent on the additional arms of good information.

It's making the rounds outside the COVID discussion as well in relation to – well. Pretty much everything. A theme of our days. The related terms are ubiquitous. Disinformation. Need for regulation. Need for better moderating. Social media. Twitter, Facebook, Youtube. Fox News. All of this is relevant. Meanwhile, and in the vein of need for culprits, we tend to neglect one group of perpetrators: us. The general public. And it's not just about the falsifiers and seducers. Every false prophet needs a sheep. Every peddler of magic potions needs a sucker. So, what makes so many of us suckers?

A while ago I was listening to a podcast about some corner on Youtube that, by the sounds of it, consists or consisted mainly of the aim to have people abuse and bully each other. Sounded terrible. But one of the things I took away from it was the thought, 'hm, strange. That's not *my* experience with Youtube.' I listen to a lot of classical music, there might be some comment there reading, 'Busoni sucks balls!', if so I haven't found it. I follow Hilary Hahn, who not only promotes and explains the music she's playing, she even published her own albums there.³⁷ I follow NASA, ESA and other space exploration-related organisations.³⁸ I subscribe to The Guardian's, the CBC's and the BBC's Youtube pages.³⁹ Like many others I watch dogs using word buttons, I watch a lot of documentaries related to other species, and tons of crow videos. I follow a channel dedicated to Shakespeare and other playwrights. And I watch a lot of recurve archery matches (only recurve, and almost only outdoors), recurve archery being arguably the most civilised sport. I watch debates with Salman Rushdie and Arundhati Roy.⁴⁰

Commentary and viewer behaviour with all this is commonly civil and respectful.

Dude, but that's because of your personal choices.

E-exactly? My personal choices do not include bullying and bogus claims. Sure enough, particularly with space exploration themes the algorithms will occasionally serve me someone trying to lure people in with a spectacular title and an absolutely hair-raising idea about the perfectly explained clumping in some of Saturn's rings, but you learn to distinguish before even clicking on the video.

Which is the point. It's that principle again, the one a pre-schooler is able to understand. How to distinguish, how to reap, how to keep the moose dung from the valuable contents? By applying common sense. By applying a strategy derived from the scientific method: don't take anything for the word of a deity, compare opinions and information, and already with the knowledge that all opinions are decisively *not* equal, pick your sources with care, beginning with pick those who dedicate their lives to the better understanding of a given subject, and ask. Never shy away from asking your teacher, or from questioning their results, it's a noble thing to do. Over while you'll just learn how to do it. It'll become easier and easier. You'll still make mistakes. But I assure you, a lot

37 <http://hilaryhahn.com/>

38 <https://www.nasa.gov/>
<https://www.esa.int/>

39 <https://www.theguardian.com/world>
<https://www.cbc.ca/>
<https://www.bbc.com/>

40 <https://www.salmanrushdie.com/>
https://en.wikipedia.org/wiki/Arundhati_Roy

fewer. Admitting to those you make, being able to change your view, is a particularly important aspect of this.⁴¹

What you mustn't do is to start believing something only because you read or hear it on an outlet that fits your own ideology. That's another thing. Who in the world had come up with it, that ideology is a good thing? It's not. Ideology per se is *not* a good idea. It's not an inevitable thing either. It's as easy as tripping into your own hell to occasionally slip back into one. But it's not an inherent attribute of being human. Being a slave to an ideology will sooner or later lead to bias, and always, and usually sooner.

The clinging to ideology, combined with an addiction to simplicity, combined with the worrying tendency towards the preference of quick blows being dealt in favour over debate, the empowerment provided by accusation and name-calling via Tweet, drain more and more colour from our world. When has it begun to turn back to such black and white thinking? You express a genuine concern about an issue, you may even be generally on the same side of your accusers to sure come, you'll still be declared a bigot instead someone to be met and convinced in a discussion. You may be a feminist icon, but if you're voicing worry over fiercely expressed readiness to allow innocent people being accused and ruined as collateral damage as part of an otherwise necessary and overdue campaign you'll still be quickly condemned as a traitor – notably without any real arguments. You're either for or against us.

Not everything one will disagree over is a cause for destroying the other. Of all the people I have ever known, encountered or heard of there's only one with whom I've so far found nothing I'd disagree over, and I'd never had the honour of meeting the man, only read him and listened to and watched him on various media.⁴² I'm thrilled whenever I find something to disagree over with people I admire, I won't admire them any less, not to mention demand they'd be fired or getting awards stripped off them, and my disagreement can often revolve around serious issues.

Then again, I'd also prefer to convey a disagreement directly to the person in question. It's of course so much safer to do it over the distance of the virtual, especially when you don't know the person, to do it in form of accusation and demand, instead a debate where you'd have to defend your reasoning. The debate is a form that is threatened by extinction. And that in turn is another threat to our abilities to deal with threats.

There's also such a thing as information lock (my term). People who learn a version of things once, and then are essentially done. It's become reality, and nothing will ever convince them that they might have to adjust, to revise. I've seen this present with perfectly non-political topics, nothing that could even be used in such a way, and to an extent that has inoculated the afflicted person against even just *hearing* a question. You add ideology to that, and to all the above, and you'll have a problem.

Truth, meanwhile, is not subject to ideology, it's not subject to opinion, and it's not subject to an extent of denial that borders on the pathological. The problem had been sneaking in before talk was of 'alternative truths', and it highlights that, when on a stage of whatever kind, we should be careful about the words we're using.

41 It is also a mistake to just assume about others that they're not capable of doing all this. When the first COVID vaccine was finally available at a mobile vaccination tent in my area a doctor asked me whether I'd like to have an information talk before getting the jab. To my polite reply, no, thanks, I had at least a year to educate myself about this virus, her reaction was an automatic response: 'don't believe everything you read on the internet.' It's become a widespread habit to just spout this sentence. What it really says is that the speaker just assumes that you're not able to distinguish information. Given that the person spoken to is likely someone the speaker doesn't know, this standard throw-away phrase is not only insulting. Generally it accomplishes absolutely nothing.

42 https://en.wikipedia.org/wiki/Douglas_Adams

The phrase has made its nest among us, it's used by some of the most sober-minded, a manner of speech that has become fashionable, but even when uttered by someone who knows how to distinguish, there'll always be others who'll take it verbatim before having to think about it. It's the notion of each of us having 'different truths'. You see where this is going, how different is 'different' from 'alternative'?

It's an idiotic concept, removed from reality, and it may indeed be something that's merely been picked up by the extremists, and even those who use 'truth' as a placeholder for 'view' can at least be accused of having a poor grip on vocabulary. What they're talking about is *perception*.

Perception leading to a particular perspective, and it's far from being a truth yet. The dwarf cichlid, a small fish often imprisoned in fishtanks for the edification of our spirits, will see something very differently to we see when looking at any given object because it is able to use infrared waves on the spectrum of light, and particularly non-solid but to us opaque formations like clouds will reveal themselves quite differently to the cichlid. Who are you to tell the fish it don't see right? The fish could tell you the same.

Different from the cichlid we have evolved to adding organs to the ones we have, by building them, telescopes, for example, the latest we've built and sent out is a jewel when it comes to cichlid optics, compare a Hubble telescope image of a galaxy to one made by the James Webb Space Telescope of the same galaxy.⁴³ Images of the Crab Nebula will look different depending on which wavelength along the spectrum of light will be used. A complete picture can only be achieved when combining all these wavelengths into one image.⁴⁴ But nobody sees that way with one pair of eyes, or how many pairs someone may have.

The point is that perception, no matter which, will never give us the whole picture. And a perspective reached without employing more than one means will always be inferior to the one achieved by using multiple means. Meanwhile the universe works in its ways independently from us, and for much longer than we have existed.

The 'we all have different truths'-notion is as useless as other lazy talking points that are heard or read, liked because they seem to make a quick, easy sense, and then repeated over and over until they're just accepted by the majority for the sole virtue of having been around for a while. And ever so often they reveal a die hard solipsism still lurking inside us. Think of the silly, useless but nevertheless too often asked question 'if a tree falls in a forest and nobody's around will it make a sound' – so often asked in a rhetorical manner as if we can't have an answer to it.

Well, for starters, and just to get it out of the way, since we're talking forest, there's already plenty of ears around to hear the darn thing falling. Once again, we're not alone on this planet, we're not the only ones who count. More importantly, there's a reason for both the sound and the ears to pick it up. Sensory organs evolve due to environmental incitement; there is a feature the use of which can be advantageous, making the best of it will give you one more chance to fare better. The reason why we have so many eyes and ears and noses on this planet, and so many different kinds that have so many times evolved independently from another is that these incitements, these environmental features are provided. To focus on sound, every planet worth living on, and most others on which we couldn't survive, have an atmosphere. An atmosphere is a medium that will carry sound, as opposed to the vacuum of space. So will water. And it will do so from the start, long before humans will have evolved, long before there'll even be any life on this planet. Humanity has not graciously blessed the planet Mars with the Perseverance rover finally bringing sound to its surface. Percy brought microphones, that's all.⁴⁵ Mars has an atmosphere, much thinner than ours, and composed to most parts of carbon dioxide, but it carries. It had carried all along. An avalanche on Mars will produce sounds, even with nobody around to hear it.

43 <https://webbtelescope.org/resource-gallery/images?Collection=First%Images>

44 https://commons.wikimedia.org/wiki/File:Crab_Nebula_in_Multiple_Wavelengths_2.png

45 <https://mars.nasa.gov/mars2020/multimedia/audio/>

Equally useless and embarrassing, and for the same reasons, is the sentence 'time is but an illusion created by our minds', most frequently uttered by guys with too many shirt buttons open for the purpose of getting into a girl's pants by appearing like a thoughtful philosopher type. Words like 'perception', 'perspective', 'view' and 'opinion' must be kept separate from Truth.

The truth is not ours. It's only ours to discover, and eventually, hopefully, to understand.

Within the narrow frame of our experience there are, however, things we have come to identify as facets that make up the whole of reality. We can *talk* about truth where we can use experience to predict outcomes, where reality reveals itself to us in a manner distinct from mind-obliterating miracle that defies the laws of physics so far discovered. That's what makes up common sense, a reliable enough framework.

I truly wish people would stop using this faulty commonplace wisdom of different truths dependent on individual. It feeds into a narrative of relativism that is nothing less than dangerous, the idea that we can believe whatever we want and declare it to be true, and it gets the more dangerous when it becomes an item for sale, and when enough people buy into the narrative to buy the product. The result is a public led astray from reality itself, a public you can sell the most transparent and ridiculous lies to, a public composed of ignorant children, shouting 'take your government hands off my Medicare', and believing the fictional image of the nefarious laboratory before even having the slightest information about what these labs are doing.

From there it is easy to instil suspicion against the experts. Those using long training, expertise and the right tools for a better understanding. All you have to do is calling them 'the elite' – that's usually begun by individuals fitting the description far better. It works, because another aspect to all this is misplaced shame. Misplaced, and then buried, but still active. Nobody likes to look 'like an idiot', or more accurately here, like someone uneducated and poorly informed. Poor information and lacking education can be helped, instead that idea is being pushed away, and ignorance is either denied or, and these are even no longer rare cases, outright celebrated.

At which point you're forgiven when stepping back, thinking, 'my, my, it looks as if really *everything* is going the wrong way...'

The supermarket in which to sell 'alternative truths' is ideology. Best suited. Ideologies aren't good for delivering good solutions. But they're very good for offering you *quick* solutions.

But social media. That word, nowadays often used with what amounts to the sound of terror. It is certainly true that better moderating is needed, with some platforms more than with others, and for that we may need better oversight. Youtube, Google, that is, isn't innocent. During lockdown a lot of content providers that hadn't big enough names to count as verified, in whatever way, found themselves threatened with being demonetized by Youtube if they'd use words such as 'COVID' or 'coronavirus'. That was Youtube's 'brilliant' idea of responding to the demand of reining in disinformation. 'There, we've done..., you know. Something.' The only thing they did was censoring normal speech. Not allowing them to speak normally about whether they could make up for a tour they had to cancel. And it didn't change a thing. All people had to do was inventing code words. What a way to pull a Pilate.

But demanding from the media platforms to get their act together is only one part of the deal. You can moderate your platform to death, eventually you'll reach a point when it frankly becomes unusable. A social media platform is space. Virtual space. What matters, the contents, that's being created by the users. That's *us*. You can legislate every platform into becoming draconic monasteries where only cute puppy videos are being left (and only after blurring one of them licking his genitals), it won't change the problem of attitude on behalf of the public.

Cowardice has once again to do with how far we've let it come. At the one end we've chickened before the university student literally screaming the demand for a safe space – no, sweetheart, you

don't have this right. You have the right to be exposed to ideas different from yours, including ideas that seem wrong to you, and that's it. And yes, I just called you 'sweetheart'. At the other end we seem intend of turning what amounts to the general public into a bunch of children and keep it that way. Mind you, some lawmakers will certainly prefer it.

Certainly, we have to listen to the woes of those who don't seem to grasp rather plain and simple principles. And I'd say we've done that. To the point from where on we can already call it wasting our time. Precious time. It's hard not to hear, they're usually the loudest, both in the U.S. House of Representatives and as members of the public.

To all those who call views like this one condescending, I ask you the following bundle of questions, and I have to preface it by impressing upon you that I'm not being cynical. I don't mean them rhetorically either, I want an answer, I'm dead serious: those people, who turn up on Dealey Plaza seriously expecting Kennedy to return to join Trump to reinstate him as president, are they braindead? Remember, I'm not being facetious, I mean it. The people who claim that Bill Gates has been hiding microchips in a vaccine to control us, do they have brain tumours? Are they perhaps mentally disabled? Suffering from learning debilities? Are the people who voted for a lady who claimed that Jewish space-lasers caused wildfires affected by a new form of psychosis?

No? Then why are you treating them as if they were? Why are you giving them half the mic time? You are aware that they're allowed to operate vehicles, aren't you? In the U.S. they're permitted to carry guns loaded with live rounds.

Who is really the condescending one here?

We've arranged it so that the general public is getting a pass. Is let off the hook. But it's the public who votes. It's the public who creates content on Youtube, on Twitter. Who passes these contents on. Who has this great tool that enables everyone to sufficiently learn about things, but who so often drives the boycott that blunts the tool. It's the public's decision whether it wants to invest in understanding things, or blindly believe those they'll follow everywhere. There is a power in both, and with one it's very unfortunate.

We've also arranged it so that those who are best equipped with the knowledge about a respective topic are being reduced to mere advisory roles. That is so in every nation, in every existing system. When it comes to society- or civilisation threatening dangers, we're dealing with 5 basic points when it comes to the assessment of these dangers:

1. what is it?
2. what would be its effect?
3. how likely is it to occur?
4. what can we do about it?
5. what *are* we doing about it, either preemptively, before it may occur, or while it's occurring?

Whether it's pandemics, climate change, asteroid- or comet impacts, thermonuclear world war, super-volcanoes, or, my personal 'favourite', and so under-discussed, planetary loss of magnetic protection (2 out of 4, folks), those professionally invested in such problems are very good at identifying points 1 – 4, down to detail.

Because of our arrangement of those same people, people who dedicate these their professional lives to the study of the respective subjects, having *no real say* when it comes to actual decisions in regards to these massive threats, we as a species really, *really*, ***really suck*** at number 5.⁴⁶

46 Perhaps the best recent example for successfully changing something about our pitiful #5 track record in regards of at least one of these threats is the DART Mission:

<https://www.nasa.gov/planetarydefense/dart/dart-news>

However, we should keep in mind that the success of this mission represents the long awaited first step. Without repeating an asteroid redirection at least once (and doing the same with a comet) we still can't say that we *have* a reliable planetary defense system. (...)

As an advisor you'll rely on the decision-makers to make the right decisions. Out of your hands. You might run into bad luck if those decision-makers think of Jewish space-lasers. If the top decision maker has equally wacko ideas, or simply other interests. If people are near-sighted. Well. There go another couple of years. Better luck with the next one. Hopefully.

Imagine those knowing best and first in charge instead when a crisis begins. And here come the cries, 'Fauci the Fascist!' *R*-right. But you're fine with someone in charge who suggested injecting house detergents.

Sorry, that too condescending for you?

Imagine we had put those best informed about all matters climate-related in charge of tackling the warming climate – worldwide. What you think? Could it be that we'd be a tad closer to preventing the worst possible future from becoming that of our descendants?

Imagine simply all of us keeping a sober mind. Not rushing into one version before all the facts are in. Which would prevent so many potential complications already. Not preferring one version due to politics, due to belief-system, due to damn ideology. Or to our own lack of information. The information is there. Just pick the right one.

The physical weapons against spreading diseases are in our hands. They might not be perfect, and they need constant updating, because between us and pathogenic microbes it's a constant arms race. But they're as good as it gets.

If you'd lived during Pasteur's lifetime, all you'd have after getting bitten by a rabid mammal is the first rabies vaccine as produced by Monsieur Pasteur and his assistants under dangerous, heroic circumstances. That vaccine was a lot less efficient than what we have today. There was always a chance that it wouldn't work. It also featured side effects, and getting it administered was painful. Not taking it, and you'd have been a bigger fool than the old man in his Mount St. Helens lodge. We've managed to practically eradicate Polio with the help of a very effective vaccine – only to see it pop up again in regions where volunteer healthcare workers are being murdered for wanting to prevent children from dying or surviving as lifelong cripples.

Measles experience a great comeback, thanks to anti-vaxxers, and the first victims are always the children, too young to have a say, too young to be able to make an objective decision within the family environment.

Some vaccines are less effective than others. Some will come with more side-effects. Any disease that can be combatted with a vaccine will have a graver effect without the vaccine, not only to one refuser, but easily to a lot others because of that one.

Most vaccines we develop now are highly effective. The few cases of severe reaction are infinitesimal compared to the sum of inoculations. That is certainly so with the existing COVID vaccines.

That we have gotten this pandemic more or less under control, for now, is not thanks to the anti-vaxxers, or to the misunderstood idea of herd immunity, it's *despite* the anti-vaxxers. It could have taken us less time without them. And it can change any moment. One new variant meets more people not getting updated jabs, and we may be back to square zero. Update vaccinations are going down. People want to forget.

We have the weapon of research. Of laboratories existing for the sole purpose of understanding pathogens and what makes them virulent. Without them nothing goes, nothing can follow. Your image of them doesn't matter. Even if we should find slack behaviour in some of them, even if a

(...) The '2 out of 4' references the fact that of the four inner, rocky planets half of them are in the process of losing their magnetic field, Mars and Venus, to strongly differing effects due to the respective conditions ruling, with Mars having already most of it. Survival on a planet isn't possible without the shielding of a magnetosphere that protects a planet's life, and its atmosphere, from the highly charged particles the perpetually 'blowing' solar wind is made of.

leak was what had caused this pandemic, the viruses, bacteria, parasites and fungi that necessitate them exist without them. We can't do without these labs.

Now we need to add the mighty weapon of good information. Of communal knowledge. It's needed not only for pandemics. It becomes obvious when known names with big platforms don't do their homework before delivering an opinion to their faithful fans. But it ultimately rests with a public that's either informed or not.

On the whole it is currently not.

Therefore the first weapon should be *everyone* doing their bloody homework.

Good Reads:

Carl Zimmer – A Planet of Viruses:

<https://carlzimmer.com/books/a-planet-of-viruses/>

Bill Wasik & Monica Murphy - Rabid: A Cultural History of the World's Most Diabolical Virus
2012, Viking, ISBN10: 0670023736

Links:

World Health Organization (WHO):

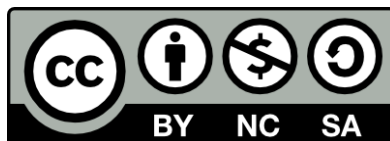
<https://www.who.int/>

European Centre for Disease Prevention and Control (ECDC):

<https://www.ecdc.europa.eu/en>

Centers for Disease Control and Prevention (CDC):

<https://www.cdc.gov/>



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